

a plurality of time frames, each having a time frame duration;  
a plurality of time slots in each of said time frames;  
a first time segment in each of said time slots, said first time segment of a particular time slot allocated for a first assigned user station to transmit a user station spread spectrum message to a base station; and

a second time segment in each of said time slots, said second time segment of said particular time slot allocated for said base station to transmit a base station spread spectrum message to a second assigned user station which sent a previous message to said base station at a time prior to said first time segment, said first assigned user station is different from said second assigned user station, said time prior to said first time segment is variable, and said first time segment precedes said second time segment.

34. (New) The frame structure of claim 33 wherein each of said plurality of time slots has the same duration.

35. (New) The frame structure of claim 33 further comprising a guard interval in each of said time slots.

36. (New) The frame structure of claim 33 wherein said second spread spectrum message includes a power adjustment command directed to said second user station.

37. (New) The frame structure of claim 36 wherein said power adjustment command is based on received signal strength of said previous message.

38. (New) The frame structure of claim 33 wherein said first spread spectrum message and said second spread spectrum message each comprises an M-ary spread spectrum signal comprising a plurality of symbol codes.

39. (New) A frame structure for regulating communications in a communications system comprising at least one base station and at least one user station, said frame structure comprising:

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a plurality of time frames; and

a plurality of time slots in each of said time frames, each time slot comprising a first time segment followed by a second time segment, said first time segment and said second time segment separated by a guard interval;

wherein said first time segment comprises a user station preamble interval followed by a user station preamble sounding gap followed by a user station data field; and

wherein said second time segment comprises a base station preamble interval followed by a base station preamble sounding gap followed by a base station data field.

40. (New) A communication signal sequence, embodied in electromagnetic carrier waves, for use in a multiple access communication system comprising at least one base station and a plurality of user stations, said communication signal sequence comprising:

a first signal broadcast from a first user station to be received by a base station; and

a second signal broadcast from said base station to be received by a second user station;

wherein said first signal is broadcast during a first time segment of a first time slot of a first time frame of a plurality of time frames, said time frame comprising a plurality of time slots, each of said time slots comprising a plurality of time segments; and

wherein said second signal is broadcast during a second time segment of said time slot of said time frame and is responsive to a third signal broadcast by said second user station at a time prior to the broadcast of said first signal by said first user station;

wherein said second time segment follows said first time segment; and

wherein said time prior to the broadcast of said first signal is variable.

41. (New) The communication signal sequence of claim 40 wherein each of said plurality of time frames has the same duration.

42. (New) The communication signal sequence of claim 40 wherein each of said plurality of time slots has the same duration.

43. (New) The communication signal sequence of claim 40 further comprising a guard interval in each of said time slots.

44. (New) The communication signal sequence of claim 40 wherein a user station preamble, a user station preamble sounding gap, and user station data are incorporated in said first signal.

45. (New) The communication signal sequence of claim 40 wherein a base station preamble, a base station preamble sounding gap and base station data are incorporated in said second signal.

46. (New) The communication signal sequence of claim 40 wherein said second signal includes a power adjustment command directed to said second user station.

47. (New) The communication signal sequence of claim 46 wherein said power adjustment command is based on a received signal strength of said third signal.

48. (New) The communication signal sequence of claim 40 wherein each of said first and second signals comprises an M-ary spread spectrum signal comprising a plurality of symbol codes.

49. (New) An apparatus for multiple access communication, comprising:  
  
a base station; and  
  
a plurality of user stations;  
  
wherein a user station transmits a user signal during a first time segment of a first time slot, of a polling loop time cycle;  
  
wherein the polling loop time cycle is comprised of a plurality of time slots and each time slot comprises a first time segment and a second time segment;  
  
wherein the base station transmits a base signal, responsive to the user signal, in the second time segment of a second time slot;

wherein the number of time segments between the first time slot and the second time slot is variable.

50. (New) The apparatus of claim 49 wherein the polling loop time cycle is followed by a second polling loop time cycle that has the same duration.

51. (New) The apparatus of claim 49 wherein each of the plurality of time slots has the same duration.

52. (New) The apparatus of claim 49 wherein each of the plurality of time slots further comprises a guard interval.

53. (New) The apparatus of claim 49 wherein the user signal comprises a user preamble and a user sounding gap.

54. (New) The apparatus of claim 49 wherein the base signal comprises a base preamble and a base sounding gap.

55. (New) The apparatus of claim 49 wherein the base signal comprises a power adjustment command directed to said user station.

56. (New) The apparatus of claim 49 wherein the power adjustment command is based on a received signal strength of the user signal.

57. (New) The apparatus of claim 49, wherein each base signal and each user signal comprises an M-ary spread spectrum signal comprising a plurality of symbol codes.

58. (New) The apparatus of claim 49 wherein the base station calculates sounding information during the time interval between the user station frame and the base station frame.

59. (New) The apparatus of claim 49 wherein the base station evaluates the need for computational time in optimizing the signal and broadcasts immediately if the need is below a predefined level and delays broadcasts when the need is above a predefined level.

60. (New) A communication system for use in a wireless multiple access communication system comprising at least one base station and a plurality of user stations, said communication system comprising:

a series of polling loop cycles, each polling loop cycle of said series of polling loop cycles comprising

a polling loop cycle duration;

a plurality of time slots, each time slot comprising a first time segment and a second time segment, said first time segment proceeding said second time segment;

a user station comprising

a user station transmitter;

user station circuitry adapted to allocate a user station transmission from said user station transmitter during said first time segment of one of said time slots of one of said polling loop cycles of said series of polling loop cycles;

a base station comprising

a base station receiver adapted to receive said user station transmission from said user station transmitter;

a base station transmitter adapted to transmit a base station transmission within a variable time period upon receipt of said user station transmission;

base station circuitry adapted to allocate said base station transmission from said base station transmitter during said second time segment of one of said time slots of one of said polling loop cycles of said series of polling loop cycles.


61. (New) The communication system of claim 60 wherein said user station transmission and said base station transmission occupy a particular time slot of a particular polling loop cycle of said series of polling loop cycles.

62. (New) The communication system of claim 60 wherein said user station further comprises a user station receiver adapted to receive said base station transmission.

63. (New) The communication system of claim 60 further comprising a second user station which has sent a previous message to said base station within a variable time period, said second user station comprising a second user station receiver adapted to receive said base station transmission.

64. (New) The communication system of claim 60 wherein said user station transmission comprises a user station preamble, a user station preamble sounding gap, and a user station data transmit frame.

65. (New) The communication system of claim 60 wherein said base station transmission comprises a base station preamble, a base station preamble sounding gap, and a base station data transmit field.

 66. (New) The communication system of claim 60 wherein said base station transmission includes a power adjustment command.

67. (New) The communication system of claim 60 wherein said user station transmission includes a power adjustment command.

68. (New) The communication system of claim 60 wherein said user station transmission and said base station transmission comprise an M-ary spread spectrum signal comprising a plurality of symbol codes.

69. (New) The communication system of claim 60 wherein said base station further comprises circuitry adapted to optimize said base station transmission.

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